

REMARKS/ARGUMENTS

The Office Action April 6, 2004, has been carefully reviewed in light of the Examiner's helpful comments and suggestions.

As a result of the Office Action, claims 21, 22, and 40 are objected to for containing minor typographical errors, all of which have been addressed by the above amendments in a manner suggested by the Examiner.

Claims 21, 22, 33, 35, and 37-39 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite. All those Section 112, second paragraph, indefiniteness rejections have been addressed by the above amendments. Moreover, claims 18, 20, 23-27, 30, 32, 34-36, and 39 stand rejected under 35 U.S.C. 102(b) as being anticipated by Kieninger '771. Claim 19 stands rejected under 35 U.S.C. 103(a) as being unpatentable over Kieninger '771 in view of Kieninger '763. Claims 28 and 29 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Kieninger '771. Claims 31 and 33 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Kieninger '771 in view of U.S. 5,934,842 to Gupta. Claim 40 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kieninger '771 in view of U.S. 4,929,131 to Allemann. However, claims 21, 22, 37 and 38 are indicated to be allowable if rewritten in independent form and amended to overcome the Section 112, second paragraph, rejections. In connection with the rejected claims, Applicants respectfully submit that the prior art references do not teach or suggest the invention as now claimed and provide the following remarks in favor of the patentability of those rejected claims.

By the above amendments, claim 18 has been canceled without prejudice and new claims 41 and 42 have been added to better define the claimed invention. No new matter has been added. Moreover, the dependent claims have been amended to correct their dependencies and they are now dependent from claim 41.

As a preliminary matter, Applicants would like to point out that the Kieninger '771 cutting tool cannot be used at very high rotational speeds which involve high centrifugal forces. For such high speed applications, considerable measures have to be taken for ensuring the safety of personnel near and operating such tools and also for preventing damage to the nearby objects. This prior art cutting tool is not equipped with a security feature and no measures are taken for the case of centrifugal defects, that is, to avoid any accidents in such cases.

One of these features is the clamping device which consists of the differential screw 51 and the two clamping members 52, 53 of corresponding internal screw thread and at an axial distance from each other. The clamping engagement occurs by contracting the two clamping members 52, 53 by means of the differential screw 51. In case of an accidental loosening of the arrangement, this may result in falling apart of the elements which are not retained by any means and, thus, fly away with extremely high velocity. The claimed cutting tool is designed for high rotational speeds and several safety features are foreseen. Thus, the clamping element 270 of Fig. 19 is provided with an inclination 274 which engages with the inclination 260 of the cutting insert 250. The angle of inclination is selected such that it is not directed to the outside, see Fig. 23. Should the clamping screw break, this will not result in loosening of the arrangement, but in a further fixing. It is not possible that

these parts become detached during operation because the thread directions and inserting directions are chosen such that clamping of the parts even becomes stronger. This feature is given by the clamping wedge 270 being the clamping element and being an one-part piece (instead of said two clamping members 52, 53 as in the case of cited prior art, see Fig. 9). By the way the clamping element does not have an extra receiving part, but is received in its seat 230 as this is also the case for the cutting insert with seat 220. The positive fit of the cutting inserts contributes to the safe position thereof, and these features allow using the tool at very high speeds.

Contrary to the Examiner's position, the effect of clamping is not providing a seat for the cutting insert, but the supporting body 36 is clamped by applying the clamping means (see col. 5, lines 59-62). This clamping engagement by no means is a positive fit, but a non-positive fit, namely, a frictional connection by force. A positive fit is defined to be caused by the shape of the two parts which ensures their contact.

There is an inclination provided which allows a large contact surface between the clamping and support element. Moreover, the prior art structure is such that the adjustment of the tool is not variable. Therefore, in view of the foregoing, it is respectfully submitted that claim 41 is patentable over the prior art.

As to claim 20, the screw 56 is a screw for adjustment. The screws 24, 25 are provided for adjusting the position of the cutting insert.

As to claim 21, the clamping parts 52, 53 are displaceable, since this function is necessary for their clamping engagement.

As to claim 24, the structure according to the invention uses an one-part clamping element and positive-fit thereof.

As to claim 25, the screw 49 is an adjusting screw which extends through bore 48 and subsequent indentation (recess) 46 in supporting body 36. For moving the supporting body, the screw 49 necessarily has to be arranged at an angle with respect to its longitudinal axis so that it can be displaced against the action of the spring 45. The screw 49 is not provided for any mounting retaining purposes contrary to the clamping parts 52, 53. Applicants respectfully submit that it is not reasonable to interpret a set screw as a clamping element. The teaching of claim 25 is to provide an inclination 274 for the clamping engagement between the clamping element 270 and the cutting insert.

The screw 40 has an engaging force with the supporting body 36 which is directed along its longitudinal axis (axial) direction and exerts this force in the longitudinal direction of the recess 46.

The inclination results in a further wedging of the cutting insert and of the clamping element. The resulting positive fit leads to a tight connection between the two elements and these cannot be detached from each other.

In case of the prior art cutting tool, the parts fall apart if any breaking occurs because no positive and blocking fit is provided. The angle in Figure 4 of the prior art is considerably larger than the 10 degree angle as indicated in claim 26.

As to claim 27, the faces of the clamping elements 52, 53, are adapted to match the (shell) shape of the supporting body 36 (see the bottom of col. 5). Thus, there is no inclination or slope. The little slope difference of these inclinations (see

claim 28) results in a wedging of the clamping element and of the supporting body such that these parts may not be detached anymore and this blocking engagement prevents any loosening of parts.

As to claim 39, screw 24 is a capped screw and is not a taper screw. Applicants respectfully submit that the Examiner's position is not reasonable and far too broad in that respect.

Moreover, the Kieninger '763 teaches a cutter head which has an eccentric bushing 17 acting as a radial adjustment bushing (see col, 3, lines 55, 56). The eccentric bushing 17 is secured in the main body by means of a fixing pin 27. For compensating any play between the eccentric bushing 17 and the fixing pin 27, a cup spring 23 biases the bushing 27 in the axial direction. The eccentric bushing 27 is received in a running fit. Such a fit does not allow working at high speed. In addition, this cutter head does not allow a longitudinal adjustment. When the diameter is adjusted, this results in a change of the cutting insert angle and thus, no correct location at the basic body is possible. Therefore, this reference does not teach or suggest a positive-fit for either of the cutting insert or the clamping element.

As to claims 28 and 29, claim 28 specifies the angles not only to be different, but teaches how to arrange the inclination. As indicated above, this arrangement allows to safely exclude any possibilities of a loosening of the clamping element and of the supporting member. Thus, their engagement is even increased in case of a rupture or other occurrence. The screws 24, 25 are set screws (adjustment screws) which are provided on opposed positions. Because of their paired arrangement provision of differential screws appears to be most redundant.

Moreover, Gupta teaches a tool of a radically different structure, wherein it does not include a basic body as it is conventional for milling cutting heads. Instead, a rotatable hub is provided. It does not include turning plates. No diameter adjustably is provided. No adjustability in longitudinal direction is provided.


Furthermore, Allemann does not allow a controlled diameter adjustment since the face angle is varied at the same time. No controlled adjustment is possible for each cutting blade. Also, the cutting edge cannot be adjusted.

In view of the foregoing, Applicants respectfully submit that claim 41 and other dependent claims are patentable over the prior art.

Each issue raised in the Office Action dated April 6, 2004, has been addressed and it is believed that claims 19 - 42 are in condition for allowance.

Wherefore, issuance of a timely Notice of Allowance is earnestly solicited.

Respectfully submitted,
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